Claim Listing with Markings to Show Current Amendments

1. (Currently Amended) A topical formulation for reducing skin irritation in animals comprising at least 0.5% by weight to about 10% by weight of the total formulation of aqueous-soluble divalent strontium cation, and a suitable topical formulation vehicle, wherein said topical formulation is packaged with instructions directing the administration of said composition to the skin of an animal subject~~, and wherein said formulation is effective to prevent or reduce skin irritation at the skin site where the formulation is administered~~.

2. (Withdrawn) The formulation of claim 1 wherein the formulation is an aqueous liquid.

3. (Original) The formulation of claim 1 wherein the formulation is a cream, lotion or gel.

4. (Withdrawn) The formulation of claim 1 wherein the formulation is a solid.

5. (Withdrawn) The formulation of claim 2 wherein the formulation vehicle comprises water and an organic solvent.

6. (Withdrawn) The formulation of claim 5 wherein the organic solvent is an alcohol.

7. (Withdrawn) The formulation of claim 2 wherein the formulation vehicle comprises a surfactant.

8. (Withdrawn) The formulation of claim 7 wherein the surfactant comprises a nonionic surfactant.

9. (Withdrawn) The formulation of claim 7 wherein the surfactant comprises a cationic surfactant.

10. (Withdrawn) The formulation of claim 7 wherein the surfactant comprises an amphoteric surfactant.

11. (Withdrawn) The formulation of claim 7 wherein the surfactant comprises at least one anionic surfactant and at least one amphoteric surfactant.

12. (Withdrawn) The formulation of claim 11 wherein the anionic surfactant comprises at least one surfactant selected from the group consisting of ammonium laureth sulfate, TEA laureth sulfate, sodium lauryl sulfosuccinate, sodium lauryl sarcosinate, and sodium laureth sulfate.

13. (Withdrawn) The formulation of claim 11 wherein the amphoteric surfactant comprises oleyl betaine or cocamidopropyl betaine.

14. (Withdrawn) The formulation of claim 7 wherein the surfactant comprises at least one nonionic and at least one cationic surfactant.

15. (Withdrawn) The formulation of claim 14 wherein the nonionic surfactant comprises at least one surfactant selected from the group consisting of Polysorbate 20, Polysorbate 40, Polysorbate 60, and Polysorbate 80.

16. (Withdrawn) The formulation of claim 14 wherein the cationic surfactant comprises cocamidopropyl phosphatidyl PG-dimonium chloride.

17. (Withdrawn) The formulation of claim 2 wherein the formulation vehicle further comprises at least one ingredient selected from the group consisting of viscosity adjusting agents, emollients, and moisturizers.

18. (Withdrawn) The formulation of claim 2 wherein the formulation vehicle comprises

water and at least one ingredient selected from the group consisting of preservatives, fragrances, dyes, pigments, and colorants.

19. (Withdrawn) The formulation of claim 2 wherein the formulation comprises an active ingredient.

20. (Withdrawn) The formulation of claim 19 wherein the active ingredient is selected from the group consisting of antibiotic, local anesthetic, sunscreen, retinoid, antiperspirant, antihistamine, analgesic, contraceptive, anti-acne and anti-dandruff ingredients.

21. (Withdrawn) The formulation of claim 2 wherein the formulation further comprises an irritant ingredient.

22. (Withdrawn) The formulation of claim 21 wherein the irritant ingredient is selected from the group consisting of carboxylic acids, keto acids, α-hydroxy acids, β-hydroxy acids, retinoids, peroxides, fragrances, preservatives, and organic alcohols.

23. (Withdrawn) The formulation of claim 21 wherein the irritant ingredient comprises an α-hydroxy acid.

24. (Withdrawn) The formulation of claim 23 wherein the α-hydroxy acid comprises at least one acid selected from the group consisting of lactic acid, glycolic acid, citric acid, and salts thereof.

25. (Withdrawn) The formulation of claim 21 wherein the irritant ingredient is a retinoid selected from tretinoin, retinol, retinal and derivatives thereof.

26. (Original) The formulation of claim 3 wherein the formulation comprises a surfactant.

27. (Original) The formulation of claim 26 wherein the surfactant comprises a nonionic surfactant.

28. (Withdrawn) The formulation of claim 26 wherein the surfactant comprises a cationic surfactant.

29. (Withdrawn) The formulation of claim 26 wherein the surfactant comprises an amphoteric surfactant.

30. (Withdrawn) The formulation of claim 26 wherein the surfactant comprises at least one anionic surfactant and at least one amphoteric surfactant.

31. (Withdrawn – Currently Amended) The formulation of claim 30 wherein the anionic surfactant comprises ~~comprises~~ at least one surfactant selected from the group consisting of ammonium laureth sulfate, TEA laureth sulfate, sodium lauryl sulfosuccinate, sodium lauryl sarcosinate, and sodium laureth sulfate.

32. (Withdrawn) The formulation of claim 30 wherein the amphoteric surfactant comprises oleyl betaine or cocamidopropyl betaine.

33. (Original) The formulation of claim 3 wherein the formulation vehicle comprises at least one ingredient selected from the group consisting of viscosity adjusting agents, emollients, and moisturizers.

34. (Original) The formulation of claim 3 wherein the formulation vehicle comprises at least one ingredient selected from the group consisting of preservatives, fragrances, dyes, pigments, and colorants.

35. (Original) The formulation of claim 3 wherein the formulation comprises an active

ingredient.

36. (Original) The formulation of claim 35 wherein the active ingredient is selected from the group consisting of antibiotic, local anesthetic, sunscreen, retinoid, antiperspirant, antihistamine, analgesic, contraceptive, anti-acne and anti-dandruff ingredients.

37. (Original) The formulation of claim 3 wherein the formulation further comprises an irritant ingredient.

38. (Original) The formulation of claim 37 wherein the irritant ingredient is selected from the group consisting of carboxylic acids, keto acids, α-hydroxy acids, β-hydroxy acids, retinoids, peroxides, and organic alcohols.

39. (Original) The formulation of claim 38 wherein the irritant ingredient comprises an α-hydroxy acid.

40. (Original) The formulation of claim 39 wherein the α-hydroxy acid comprises at least one acid selected from the group consisting of lactic acid, glycolic acid, citric acid, and salts thereof.

41. (Withdrawn) The formulation of claim 37 wherein the irritant ingredient is a retinoid selected from tretinoin, retinol, retinal, and derivatives thereof.

42. (Original) The formulation of claim 3 wherein the formulation vehicle comprises an emulsifier.

43. (Original) The formulation of claim 42 wherein the emulsifier comprises a nonionic emulsifier.

44. (Original) The formulation of claim 42 wherein the emulsifier comprises a cationic emulsifier.

45. (Original) The formulation of claim 42 wherein the emulsifier comprises at least one nonionic emulsifier and at least one cationic emulsifier.

46. (Withdrawn) The formulation of claim 4 wherein the formulation vehicle comprises a surfactant.

47. (Withdrawn) The formulation of claim 46 wherein the surfactant comprises a nonionic surfactant.

48. (Withdrawn) The formulation of claim 46 wherein the surfactant comprises a cationic surfactant.

49. (Withdrawn) The formulation of claim 46 wherein the surfactant comprises an amphoteric surfactant.

50. (Withdrawn) The formulation of claim 46 wherein the surfactant comprises at least one anionic surfactant and at least one amphoteric surfactant.

51. (Withdrawn) The formulation of claim 50 wherein the anionic surfactant comprises comprises at least one surfactant selected from the group consisting of ammonium laureth sulfate, TEA laureth sulfate, sodium lauryl sulfosuccinate, sodium lauryl sarcosinate, and sodium laureth sulfate.

52. (Withdrawn) The formulation of claim 50 wherein the amphoteric surfactant comprises oleyl betaine or cocamidopropyl betaine.

53. (Withdrawn) The formulation of claim 4 wherein the formulation vehicle comprises

at least one ingredient selected from the group consisting of viscosity adjusting agents, emollients and moisturizers.

54. (Withdrawn) The formulation of claim 4 wherein the formulation vehicle comprises at least one ingredient selected from the group consisting of preservatives, fragrances, dyes, pigments, and colorants.

55. (Withdrawn) The formulation of claim 4 wherein the formulation comprises an active ingredient.

56. (Withdrawn) The formulation of claim 55 wherein the active ingredient is selected from the group consisting of antibiotic, local anesthetic, sunscreen, retinoid, antiperspirant, antihistamine, analgesic, contraceptive, anti-acne and anti-dandruff ingredients.

57. (Withdrawn) The formulation of claim 4 wherein the formulation further comprises an irritant ingredient.

58. (Withdrawn) The formulation of claim 57 wherein the irritant ingredient is selected from the group consisting of carboxylic acids, keto acids, α-hydroxy acids, β-hydroxy acids, retinoids, peroxides, and organic alcohols.

59. (Withdrawn) The formulation of claim 58 wherein the irritant ingredient comprises an α-hydroxy acid.

60. (Withdrawn) The formulation of claim 59 wherein the α-hydroxy acid comprises at least one acid selected from the group consisting of lactic acid, glycolic acid, citric acid, and salts thereof.

61. (Withdrawn) The formulation of claim 57 wherein the irritant ingredient is a retinoid selected from tretinoin, retinol, retinal and derivatives thereof.

62. (Withdrawn) The formulation of claim 4 wherein the formulation vehicle comprises an emulsifier.

63. (Withdrawn) The formulation of claim 62 wherein the emulsifier comprises a nonionic emulsifier.

64. (Withdrawn) The formulation of claim 62 wherein the emulsifier comprises a cationic emulsifier.

65. (Withdrawn) The formulation of claim 62 wherein the emulsifier comprises at least one nonionic emulsifier and at least one cationic emulsifier.

The Double Patenting Rejection

Claim 1 stands provisionally rejected under the judicially created doctrine of obviousness-type double patenting as allegedly being unpatentable over claims 62, 64-66, and 68-69 of co-pending U.S. Patent Application Serial Number 10/189,344. This rejection is respectively traversed.

Claims 62, 64-66, and 68-69 are no longer pending in U.S. Patent Application Serial Number 10/189,344. Thus, without addressing the substance of this rejection, Applicants note that this rejection is moot. Withdrawal thereof is respectfully requested.

Applicants also note that the term of any patent issuing from the present application, absent any patent term adjustment or other terminal disclaimers, is the same as that of any patent issuing from U.S. Patent Application Serial Number 10/189,344, absent any patent term adjustment or other terminal disclaimers. Thus, Applicants would consider filing a terminal disclaimer to obviate any proper double patenting rejections based on U.S. Patent Application Serial Number 10/189,344 if so required at a later date. Nevertheless, withdrawal of the present rejection is now proper and hereby requested.

The 35 U.S.C. §112, First Paragraph, Rejections

The First Rejection

Claim 1 stands rejected under 35 U.S.C. §112, first paragraph, as allegedly containing subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. Specifically, the rejection refers to the phrase "wherein said topical formulation is packaged with instructions directed [sic] the administration of said compositions to the skin of an animal subject" as allegedly being "new matter." This rejection is respectfully traversed.

As noted in Applicants' Preliminary Amendment filed on November 21, 2001, concurrently with the present application, support for the amended language in claim 1 can be found, for example, in claim 69 of priority U.S. Patent Application Serial Number 08/362,100. The disclosure of that application was incorporated by reference in its entirety. *See*, for example, the first paragraph of the specification. Therefore, withdrawal of this rejection is proper and hereby requested.

The Second Rejection

Claims 1, 3, 26-27, 33-40, and 42-45 stand rejected under 35 U.S.C. §112, first paragraph, as the specification allegedly does not provide enablement for preventing skin irritation. This rejection is respectfully traversed, but is nevertheless deemed to be moot since claim 1 has been amended to remove the unnecessary phrase "wherein said formulation is effective to prevent or reduce skin irritation at the skin site where the formulation is administered." The Office Action indicated that this rejection would be overcome "by deleting the term 'prevent' in claim 1." Thus, withdrawal of this rejection is hereby respectfully requested.

The 35 U.S.C. §112, Second Paragraph, Rejection

Claims 1, 3, 26-27, 33-40, and 42-45 stand rejected under 35 U.S.C. §112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. This rejection is respectfully traversed.

After setting forth the rejection above, no further explanation is provided as to why the rejection was made or the nature thereof. Applicants believe that the currently pending claims do satisfy the requirements of 35 U.S.C. §112, second paragraph. Withdrawal and/or clarification of this rejection are respectfully requested.

The 35 U.S.C. §103 Rejections

The First Rejection

Claim 1 stands rejected under the 35 U.S.C. §103(a) as allegedly being obvious over U.S. Patent No. 4,943,432 to Biener. The rejection is respectfully traversed.

According to Manual of Patent Examining Procedure (MPEP) §2143:

> To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

The present rejection does not meet this requirement.

Claim 1 as currently amended reads as follows:

> 1. A topical formulation for reducing skin irritation in animals comprising at least 0.5% by weight to about 10% by weight of the total formulation of aqueous-soluble divalent strontium cation, and a suitable topical formulation vehicle, wherein said topical formulation is packaged with instructions directing the administration of said composition to the skin of an animal subject.

Biener describes a salt mixture for the treatment of psoriasis. As noted in the Abstract, the composition is composed *primarily* of a mixture of a magnesium halide, such as magnesium chloride, with mixed alkali and alkaline earth metal salts such as sodium and potassium chloride and/or bromide and calcium chloride or bromide. Other cations present in the salt mixture include strontium, aluminum, iron, lithium and zinc, and the anions include sulphate, hydrogen carbonate, borate, fluoride, silicate, iodide and carbonate. The Abstract of Biener teaches that the salt mixture is applied to diseased skin in solution or in a gelled form.

The application of Biener is deficient in establishing a prima facie case of obviousness for several reasons. For purposes of this Response, however, Applicants focus on Biener's lack of teaching or suggestion of topical formulations containing the amount of aqueous-soluble divalent strontium cation recited in the rejected claim.

As illustrated by the tables set forth in column 2, lines 26-36, and column 3, lines 1-12, and the surrounding text, the amount of strontium cations in applied compositions of Biener is less than that amount recited in the presently pending claim. Indeed, the amount of strontium cations in the applied compositions of Biener is minor in relation to the amount of aqueous-soluble divalent strontium cation recited in topical formulations of

the presently rejected claim. As described in the first table set forth by Biener, strontium-containing formulations of Biener contain at least about 99% by weight of a salt mixture (without factoring in the remainder of the applied composition being up to 1,000 grams water of hydration) of an ionic composition containing only 0.02 to 10.5 grams per kilogram, preferably 0.2 to 2.0 grams per kilogram, of strontium cations. That amount is less than the amount of aqueous-soluble divalent strontium cation recited in the presently rejected claim – 0.5 to 10% by weight of the entire formulation (which includes the weight of a suitable topical formulation vehicle).

Therefore, Biener does not teach or suggest each and every element of the rejected claim 1. Withdrawal of this rejection is thus respectfully requested.

The Second Rejection

Claims 3, 26, 33-38, and 42 stand rejected under the 35 U.S.C. §103(a) as allegedly being obvious over U.S. Patent No. 4,943,432 to Biener in view of U.S. Patent No. 4,477,439 to D'Alelio. The rejection is respectfully traversed.

Again, claim 1 as currently amended reads as follows:

> 1. A topical formulation for reducing skin irritation in animals comprising at least 0.5% by weight to about 10% by weight of the total formulation of aqueous-soluble divalent strontium cation, and a suitable topical formulation vehicle, wherein said topical formulation is packaged with instructions directing the administration of said composition to the skin of an animal subject.

Each of the rejected claims ultimately depends from claim 1.

As noted above, Biener is deficient in establishing a prima facie case of obviousness for several reasons, one of which is the fact that Biener does not teach or suggest topical formulations containing the amount of aqueous-soluble divalent strontium cation recited in the rejected claims. The amounts of strontium cation discussed by Biener are less than the amount of aqueous-soluble divalent strontium cation recited in the presently rejected claims – 0.5 to 10% by weight of the entire formulation (which includes the weight of a suitable topical formulation vehicle). Therefore, Biener does not teach or suggest each and every element of the rejected claims. The Patent Office's

application of D'Alelio in setting forth this rejection of alleged obviousness does not overcome the deficiencies of Biener in this regard.

D'Alelio describes treatment of irritated and excoriated areas around the stoma of ostomy patients by application of a sulfate or phosphate of barium, calcium, strontium or zinc, preferably barium sulfate. The source of irritation described therein is an appliance fitted around the stoma.

Again, each of the rejected claims recites a composition comprising "0.5% by weight to about 10% by weight of the total formulation of aqueous-soluble divalent strontium cation." However, the strontium salts disclosed by D'Alelio, strontium sulfate and strontium phosphate, are essentially insoluble in water. In fact, D'Alelio repeatedly state that all of the salts therein are in the form of a "finely divided powder" that is either dusted onto the skin or applied in a paste so that it does not become dislodged from the skin surface. *See, e.g.*, column 2, lines 16-24. This is the antithesis of an aqueous-soluble salt composition, which is required in the present invention in order for the strontium cations to "dissociate and be taken up into the water-containing milieu of the skin." *See, e.g.*, page 31, line 23, to page 32, line 5, of the present application. Accordingly, the strontium salts disclosed by D'Alelio do not account for the deficiencies of Biener in that regard.

Applicants also note that D'Alelio teaches away from claims 37 and 38, which recite topical formulations further comprising an irritant ingredient. For example, col. 1, lines 49-55, of D'Alelio cautions that various other materials may be present in the compositions "provided the added material does not cause further irritation." Rather, the source of irritation that is sought to be reduced derives solely from an appliance fitted around the stoma. Thus, this rejection cannot stand with respect to claims 37 and 38 in particular.

Thus, the applied combination of Biener and D'Alelio does not teach or suggest each and every element of the rejected claims. Withdrawal of this rejection is requested.

The Third Rejection

Claims 39-40 stand rejected under the 35 U.S.C. §103(a) as allegedly being obvious over U.S. Patent No. 4,943,432 to Biener in view of U.S. Patent No. 4,477,439 to D'Alelio, and further in view of U.S. Patent Publication No. 2001/0016604 to Yu et al. The rejection is respectfully traversed.

Again, claim 1 as currently amended reads as follows:

> 1. A topical formulation for reducing skin irritation in animals comprising at least 0.5% by weight to about 10% by weight of the total formulation of aqueous-soluble divalent strontium cation, and a suitable topical formulation vehicle, wherein said topical formulation is packaged with instructions directing the administration of said composition to the skin of an animal subject.

Each of the rejected claims ultimately depends from claim 1.

Further, rejected claims 39 and 40 depend from claim 38. As noted above, D'Alelio teaches away from claim 38, which recites topical formulations further comprising an irritant ingredient. Still further, neither Biener nor D'Alelio, alone or in combination, teach topical formulations comprising at least 0.5% by weight to about 10% by weight of the total formulation of aqueous-soluble divalent strontium cation.

Yu et al. is no more than background documentation describing topical applications for treatment of dandruff and acne. Yu et al. do not teach or suggest strontium-containing compositions. Therefore, Yu et al. do not overcome the deficiencies of Biener and D'Alelio in that regard.

In conclusion, the applied combination of Biener, D'Alelio, and Yu et al. does not teach or suggest each and every element of the rejected claims. Withdrawal of this rejection is requested.

The Fourth Rejection

Claims 27 and 42-45 stand rejected under the 35 U.S.C. §103(a) as allegedly being obvious over U.S. Patent No. 4,943,432 to Biener in view of U.S. Patent No. 4,477,439 to D'Alelio, and further in view of U.S. Patent No. 5,665,364 to McAtee. The rejection is respectfully traversed.

Again, claim 1 as currently amended reads as follows:

1. A topical formulation for reducing skin irritation in animals comprising at least 0.5% by weight to about 10% by weight of the total formulation of aqueous-soluble divalent strontium cation, and a suitable topical formulation vehicle, wherein said topical formulation is packaged with instructions directing the administration of said composition to the skin of an animal subject.

Each of the rejected claims ultimately depends from claim 1.

Again, neither Biener nor D'Alelio, alone or in combination, teach topical formulations comprising at least 0.5% by weight to about 10% by weight of the total formulation of aqueous-soluble divalent strontium cation. McAtee does not teach or suggest strontium-containing compositions. Therefore, McAtee does not overcome the deficiencies of Biener and D'Alelio in that regard.

In conclusion, the applied combination of Biener, D'Alelio, and McAtee does not teach or suggest each and every element of the rejected claims. Withdrawal of this rejection is requested.

In view of the foregoing, allowance of all pending claims is respectfully requested. If deemed useful in order to further prosecution of this application to allowance, the Examiner is invited to contact the undersigned by telephone, e-mail, facsimile, or written communication.

Respectfully Submitted,

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